

REMARKS

Applicants submit herewith a copy of an amended Figure 1 which has the legend "Prior Art" to indicate that the figure depicts what is old in the art.

The Examiner is respectfully requested to reconsider his rejection of the claims as being unpatentable over Kim (5,603,169), in view of Partus (6,616,398).

It is respectfully submitted that Claim 1 as presently written contains the proper language which distinguishes Applicants' invention from the prior art cited.

The predicate for the Examiner's rejection of the claims found in the prior Office Action is his assertion that "Kim discloses a bubbler for solid metal-organic precursors which improve the feeding efficiency and the controlling precision of the precursors," citing col.1 lines 7 - 11. In his citation of the reference the Examiner refers to Figure 1A and has selected only that portion of the disclosure as to Figure 1A which is favorable to his position with respect to the rejection. The embodiment that the Examiner has cited with respect to Figure 1A is denoted as "Prior Art" by Kim. Kim states with respect to Figure 1A at column 1, lines 29-36:

Referring initially to FIG. 1A, there is shown a bubbler for metal-organic precursors comprising a bubbler body 1a, a carrier gas feed tube 1b, and an exhaust tube 1c. As shown in FIG. 1A, bubbler body 1a contains liquid precursor and one end of carrier gas tube 1b is dipped in the liquid precursor.

Applicants' broadest claim is a method which comprises "...introducing a solid precursor into a liquid bubbler apparatus, and adding a liquid into said solid precursor-containing apparatus, said liquid chosen to have a vapor pressure which is negligible compare with said vapor pressure of said solid precursor under the operating conditions extant in said bubbler..." There is no suggestion of the use of a solid precursor in Kim's description of prior art embodiment depicted in Figure 1A.

The next embodiment disclosed by Kim is FIG 1B which discloses

"...the case that the bubbler is charged with a mass of solid metal-organic precursors. After the bubbler is operated for a certain time, there is generated a tunnel 1f, a path through which the carrier gas moves in the mass of solid metal-organic precursors. The width and depth of the tunnel change with the lapse of time, which seriously affects the contact area between precursor 1e and the carrier gas.

At this point in the description, Kim goes on to state the problems associated with the solid embodiment in FIG 1B where he states:

"...Thus the reaction gas exhausted from exhaust tube 1c carries precursors having a variable composition. Consequently, the conventional bubbler is virtually incapable of precisely controlling the concentration of the precursors in a reaction gas which is fed into a separate reactor. In addition, the bubbler is disadvantageous in that a good deal of residual precursors 1e is disused because the bubbler should be newly exchanged when the tunnel pierces the precursors in the bubbler..."

The embodiment depicted in FIG 1B of Kim does not possess a liquid and solid in contact therewith.

The Examiner further stated in support of his rejection: "*The carrier gas (in Kim) enters a bottom hole and exits through an upper exhaust hole (col. 2, lines 32 - 43).*" Kim does not disclose a liquid and solid in admixture as claimed in the present invention. In fact in the "object" stated in the preceding paragraph (Column 2, lines 29-30) that Kim seeks to prevent "precursors in solid phase from entering the facilities."

The reference to Partus is also not pertinent to the instant invention, alone or in combination. Partus discloses a method and system for controlling the delivery of vapor from a bubbler containing a supply of liquid through which a carrier gas is bubbled, and from which bubbler vapors are delivered in a vapor stream entrained with the carrier gas.

Partus directs his invention to a concentration detector within the flow path of the bubbler

vapors from the bubbler and having the output of the concentration detector input to a concentration controller.

Partus does not disclose mixing of the carrier gas with the vapor emanating from a powdered precursor material. There is no powdered precursor material in Partus as is presently claimed in Claim 1.

The present invention insures constant uniform mixing of the carrier gas with the vapor emanating from the powdered precursor material. It does so by : 1) incorporating said precursor in an ultra-low vapor pressure liquid in which it is insoluble; 2) placing the resulting slurry/suspension/emulsion in the interior of the bubble of the apparatus, the interior being defined as that volume in which the carrier gas can flow; 3) flowing the carrier gas exactly as one would do with a liquid precursor.

When these steps are carried out the splashing and agitation of the slurry incorporating the precursor serves to facilitate uniform mixing of the carrier gas and the precursor vapor. This feature is also claimed specifically in Claim 1.

Second, the present invention uniquely and unprecedentedly prevents the finely divided solid particles from recrystallizing into larger crystallites. which would lower the delivery rate of precursor vapor. It achieves this goal, as explained at length in the specification, by virtue of the insolubility of the precursor in the liquid in which it is suspended, and the concomitant separation thus effected between the solid and vapor phases of the precursor. Claim 1 as presently written defines the precursor material as "powder."

Kim attempts to solve the method of delivery by contacting the metallic precursor with a carrier gas using a compression plate and a pair of porous plates in his "bubbler" and relying only on the gas flow pattern to carry off the precursor. Thus the term "bubbler" is inaccurate when applied to Kim's device as there is no liquid phase in which the carrier gas forms bubbles,

as contrasted with Applicants' invention as presently claimed where mixing is achieved by the agitation of the suspending liquid caused by the actual bubbling of the carrier gas through the liquid. This interpretation of Kim is consistent, since, as noted above, Kim seeks to exclude solid precursors from the facility.

The present invention, by way of contrast, uses a carefully specified liquid in which solid powder precursor is contained in an insoluble suspension for the purpose of promoting mixing and for the amelioration of the recrystallization problem. It is not a method to supply a vapor stream entrained in a carrier gas which has been bubbled through a liquid.

Applicants respectfully submit that there is no basis for the combination of the Kim and Partus references cited by the Examiner. Applicants have pointed out how these references teach in different directions. The Examiner has selected elements from the cited references for the sake of showing the individual elements or steps claimed without regard to the total teaching of the references.

As noted, the Examiner is improperly picking and choosing. The rejection is a piecemeal construction of the invention. Such piecemeal reconstruction of the prior art patents in light of the instant disclosure is contrary to the requirements of 35 U.S.C. § 103.

The ever present question in cases within the ambit of 35 U.S.C. § 103 is whether the subject matter as a whole would have been obvious to one of ordinary skill in the art following the teachings of the prior art at the time the invention was made. It is impermissible within the framework of Section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. (Emphasis in original) In re Wesslau 147 U.S.P.Q. 391, 393 (CCPA 1965)

This holding succinctly summarizes the Examiner's application of references in this case, because he did in fact pick and choose so much of the Kim and Partus references to support his position and did not cover completely in the Office Action the full scope of what these varied

disclosure references fairly suggest to one skilled in the art.

In support of applicants' argument made immediately above, for example, among the prior art references cited under 35 U.S.C. §103, certain of these references contain teachings in the general field of bubblers. In Kim it is a bubbler wherein a carrier gas is fed through a bed of metal-organic precursors. There is no liquid present in the system. Partus discloses a system for accurate vapor delivery. There is a liquid in Partus, but no metal organic precursor. There is no basis for combining totally different disciplines of the use of a bubbler as has been done in the Official Action.

Further, the Federal Circuit has stated that the Patent Office bears the burden of establishing obviousness. It held this burden can only be satisfied by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the reference.

Obviousness is tested by "what the combined teachings of the references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). But it "cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." *ACS Hosp. Sys.*, 732 F.2d at 1577, 221 USPQ at 933. [837 F.2d at 1075, 5 USPQ 2d at 1599.]

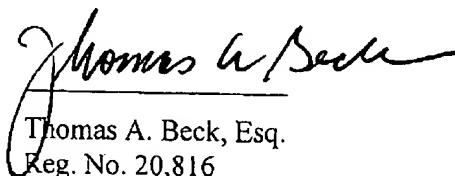
The court concluded its discussion of this issue by stating that teachings or references can be combined only if there is some suggestion or incentive to do so.

In the present case, the skilled artisan, viewing the two references, assuming he could justify a combination of the two references, would be directed toward a totally different delivery

system than is called for in the present invention. The two references teach in inconsistent directions. There is no proper basis to combine them.

Applicants have attempted in this response to comply with the Examiner's comments and to place the claims in a form which should result in their allowability. Applicants have included the substance discussed in paragraph 5 of page 7 of the prior response in an effort to place the claims in allowable form. If the Examiner wishes to discuss via telephone the substance of any of the proposed claims contained herein with the intent of putting them into an allowable form, Applicants' attorney will be glad to speak with him at a mutually agreeable time and will cooperate in any way possible. In view of the arguments and modifications to the claims, allowance of this case is warranted. Such favorable action is respectfully solicited.

Respectfully Submitted,



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